

What is claimed is:

89-114

1. An access platform comprising

a spreader member,

an inferior blade,

an inferior blade arm connected to said spreader member and  
said inferior blade,

a superior blade,

a superior blade arm connected to said superior blade and  
pivotally coupled to said spreader member at a pivot positioned  
above said superior blade, said superior blade being freely  
upwardly rotatable as a spreading force from said inferior blade  
is transmitted to said superior blade through said pivot.

2. The access platform of claim 1 further comprising

a sternal pad, and

a sternal pad arm attached to said sternal pad at a first  
end and rotatably coupled to said superior blade arm adjacent  
said pivot at a second end.

3. The access platform of claim 2 further comprising

a ratchet formed on said superior blade arm adjacent said  
pivot, and

a pawl pivotally mounted on said sternal pad arm and  
operably coupled to said ratchet.

4. The access platform of claim 3 further comprising  
a drive block operably coupled to said spreader member, and  
a cylindrical shaft extending from said drive block, said  
superior blade arm and said sternal pad arm being rotatably and  
5 releasably mounted on said shaft.

5. The access platform of claim 1 further comprising  
a compression shoe, and  
a shoe arm attached to said compression shoe at a first end  
and rotatably coupled at a second end to said superior blade arm  
10 adjacent said pivot.

6. The access platform of claim 5 further comprising  
a pinion housing operably coupled to said spreader member  
and having a moveable pivot extending therefrom,  
a cylindrical stem extending from said superior blade arm,  
15 said stem being rotatably received in said moveable pivot, and  
said sternal pad arm being rotatably mounted on said stem.

7. The access platform of claim 6 further comprising a  
moveable pivot lock mounted on said shoe arm and operably  
connected to said stem.

20 8. The access platform of claim 7 further comprising a  
vertical displacement member connected to said spreader member  
and operably interconnected to said compression shoe and said  
shoe arm.

9. The access platform of claim 8 further comprising an offset link attached to said spreader member, and an adjustable offset drive screw operably connected to said offset link and said shoe arm.

5 10. The access platform of claim 9 further comprising first and second spaced apart fingers formed in an end of said offset link opposite said spreader member, and a bushing rotatably captured by and extending between said first and second fingers.

10 11. The access platform of claim 10 further comprising a boss extending from said shoe arm, said boss having a recess adapted to receive a hemispherical end of said adjustable offset drive screw.

15 12. The access platform of claim 1 wherein said spreader member comprises

a drive base, said inferior blade arm extending from said drive base,

20 a drive shaft operably coupled to said drive base, said superior blade arm being pivotally interconnected and operably coupled to said drive shaft, and

a first handle attached to a first end of said drive shaft.

13. The access platform of claim 12 further comprising  
a second handle rotatably coupled to said drive base and  
threadably connected to said drive shaft, and

a carrier threadably connected to said drive shaft and  
5 translatably connected to said drive base and said drive shaft,  
said carrier and said second handle having oppositely wound  
threads, and said superior blade arm being pivotally  
interconnected to said carrier.

14. The access platform of claim 13 further comprising  
10 a carrier arm extending upwardly and outwardly from said  
carrier,

a branch extending from said superior blade arm, said branch  
being pivotally captured by said carrier arm at said pivot  
positioned above said superior blade, and

15 a tab extending downwardly from said branch of said superior  
blade arm and operably contacting a second end of said drive  
shaft extending beyond said carrier.

15. The access platform of claim 14 further comprising  
a sternal pad, and

20 a sternal pad arm extending from said drive base and  
connecting to said sternal pad.

16. The access platform of claim 15 further comprising  
a bearing support extending upwardly from said drive base,  
and

a bearing coupled to said bearing support, said second  
5 handle being rotatably coupled to said bearing, said drive shaft  
being slidably received through said bearing and said bearing  
support.

17. The access platform of claim 16 wherein said bearing  
support, drive base, inferior blade, inferior blade arm, sternal  
10 pad and sternal pad arm are formed from one-piece construction.

18. The access platform of claim 1 further comprising  
a sternal pad,  
a sternal pad arm extending from said spreader member and  
connecting to said sternal pad.

15 19. The access platform of claim 18 further comprising  
an offset stanchion extending upwardly from said sternal pad  
arm, said superior blade arm being pivotally mounted to said  
offset stanchion at said pivot located above said superior blade,  
a compression member extending from said offset stanchion,  
20 a counter-lift tab extending from said superior blade arm  
adjacent said offset stanchion in spaced relation with said  
compression member, and

an offset spring interposing and operably coupling to said  
compression member and said counter-lift tab.

20. The access platform of claim 19 wherein said inferior blade arm is translatably coupled to said spreader member.

21. The access platform of claim 20 wherein said compression member is pivotally connected to said offset  
5 stanchion and adjustably interconnected to said spreader member.

22. The access platform of claim 21 further comprising an offset lead screw threadably connected to said compression member and rotatably interconnected to said spreader member.

10 23. The access platform of claim 1 further comprising a tissue retractor mounted to said superior blade.

24. The access platform of claim 23 wherein said tissue retractor comprises a plurality of interconnected fingers.

15 25. The access platform of claim 24 further comprising a positioner mounted to said superior blade and rotatably coupled to said plurality of interconnected fingers, said plurality of interconnected fingers being freely rotatable in a first direction and prevented from rotating in a second direction by said positioner.

20 26. The access platform of claim 25 wherein said positioner comprises

an elongated base mounted to said superior blade,  
a guide attaching to said base and extending along said base,

a brake radially extending from said guide and extending along said base, and

a sleeve interconnected to said plurality of interconnected fingers, said sleeve being rotatably mounted over said guide and  
5 said brake.

27. The access platform of claim 26, wherein said positioner further comprises a flexure interconnecting said guide to said brake.

28. The access platform of claim 27, wherein said guide  
10 comprises a central portion integrally formed with said base and outer portions formed in a spaced relation with said base, and said positioner further comprises a tab extending upwardly from said brake adjacent said central portion of said guide.

29. The access platform of claim 28, wherein said brake is  
15 generally pie-shaped and includes a radius that is sized to direct said brake into contact with said sleeve to inhibit the rotation of said sleeve in the second direction.

30. The access platform of claim 24 wherein said tissue retractor comprises

20 a retractor arm rotatably coupled at a first end to said superior blade arm,

a spindle extending outwardly from a second end of said retractor arm, and

an elastic sheet attached to and extending between said spindle and said second blade.

31. The access platform of claim 1 wherein said spreader member includes a block and tackle drive mechanism.

5 32. The access platform of claim 31 wherein said block and tackle mechanism includes a clutch.

33. The access platform of claim 32 wherein said clutch comprises

a clutch housing,

10 a cylindrical capstand rotatably mounted in said clutch housing, and

a hub releasably coupled to and coaxially mounted within said capstand.

15 34. The access platform of claim 33 wherein said clutch further comprises

first and second dowel pins extending longitudinally along the exterior of said hub, said first and second dowel pins being partially captured in first and second recesses along the interior of said capstand, and partially captured within a slot  
20 bored through said hub, and

a spring mechanism positioned within said slot of said hub and interposed between said first and second dowel pins, said spring mechanism biasing said dowel pins outwardly into said first and second recesses of said capstand.



35. The access platform of claim 1 wherein the spreader member further comprises

a gear driven lead screw having first and second portions with oppositely wound threads thereon, and

5 first and second drive blocks operably interconnected to said first and second portions of said gear driven lead screw and said inferior and superior blade arms.

36. The access platform of claim 1 wherein said spreader member comprises

10 a spreader base,

an harmonic gear drive mounted in said spreader base,

first and second spreader arms coupled to said harmonic gear drive,

15 first and second blade arm mounts pivotally coupled to said inferior and superior blade arms,

first and second spreader links pivotally coupled to said first and second spreader arms and first and second blade arm mounts, respectively, and

20 first and second guide links pivotally connected to said first and second blade arm mounts and said spreader base.

37. The access platform of claim 1 wherein said spreader member comprises

a lead screw,

a carrier threadably mounted on said lead screw, and

a plurality of links pivotally connected to said carrier and said inferior and superior blade arms.

38. The access platform of claim 1 wherein said superior blade is convertible from a spreader type blade to a lifting type blade.

39. The access platform of claim 38 wherein said superior blade further comprises a slot formed therein, and an elongated vane member foldably received within said slot.

40. The access platform of claim 38 wherein said superior blade comprises

a slot formed therein, and

a flexible and extensible elongated vane member slidably received within said slot.

41. The access platform of claim 40, wherein said extensible flexible vane member is flexible in a first direction and comprises a restraint to prevent flexing in a second direction.

42. The access platform of claim 38 wherein said superior blade comprises

a spreader blade member having a groove formed in its upper portion and a tongue extending from its lower portion, and

an offset blade member detachably coupled to said spreader blade member, said offset blade member comprising a throat section having a recess formed therein, a tongue extending from

an upper portion of said recess to mate with said groove of said spreader blade member, a groove formed in the lower portion of said recess to mate with said tongue of said spreader blade member, and an elongated vane portion extending out from the throat section.

43. The access platform of claim 1 wherein said superior blade includes a forced tapering flexible edge extending from and coupled to one end of said superior blade via a tongue and groove type connector.

44. The access platform of claim 1 wherein said superior blade comprises a tissue retractor formed integrally therewith.

45. The access platform of claim 1 wherein said superior blade comprises a plurality of access mounts formed on the back side of said superior blade.

46. The access platform of claim 45 wherein a heart stabilizer is mounted in one of said plurality of access mounts.

47. The access platform of claim 45 wherein a malleable shaft blower is mounted in one of said plurality of access mounts.

48. The access platform of claim 45 wherein a flexible blower and hose is coupled to one of said plurality of access mounts.

49. The access platform of claim 45 wherein a suction boot is mounted in one of said plurality of access mounts.

50. The access platform of claim 45 wherein a surgical clip is mounted in one of said plurality of access mounts.

51. The access platform of claim 45 wherein a light source is mounted in one of said plurality of access mounts.

5 52. The access platform of claim 1 further comprising a surgical clip, a mount coupled to said superior blade arm, and a stem extending from said mount and connecting to said surgical clip.

10 53. The access platform of claim 52 further comprising an intermediate mounting block interposed between said mount and said superior blade arm, and coupled to said superior blade arm.

15 54. The access platform of claim 53 wherein said intermediate mounting block comprises input ports providing access to sources of suction, aeration and electrical power.

55. The access platform of claim 53 wherein said intermediate mounting block further comprises output lumens to interconnect surgical tools to sources of suction, aeration and electrical power interconnected to said input ports.

20 56. The access platform of claim 1 further comprising a light panel electrically coupled to a light source and mounted to said superior blade and said superior blade arm.

57. The access platform of claim 56 wherein said light panel comprises a light directing contoured surface.

58. The access platform of claim 1 wherein said superior blade arm comprises a universal port providing access to sources of electrical power, aeration and suction.

59. The access platform of claim 58 wherein said superior blade arm further comprises an on/off switch coupled to said universal port.

60. The access platform of claim 59 wherein said on/off switch operably locks a universal connector in an engaged position with said universal port.

61. The access platform of claim 1 wherein said superior blade comprises

an embedded electrical source extending along the back side of said superior blade,

a first dovetail slot extending along the backside of said superior blade,

a slide slidably received in said first dovetail slot, said slide comprising a second dovetail slot formed therein, and

a connector received in said second dovetail slot, said connector including a push button that electrically couples a surgical tool to said embedded electrical source.

62. The access platform of claim 1 further comprising a suture holder coupled to said inferior and superior blade arms, said suture holder surrounding an access area between said

inferior and superior blades when said inferior and superior blades are positioned within an incision in a patient's chest.

63. The access platform of claim 62 wherein said suture holder is constructed from felt.

5 64. The access platform of claim 62 wherein the suture holder is constructed from foam.

65. The access platform of claim 62 wherein the suture holder is constructed from rubber.

10 66. A self-aligning access platform comprising  
first and second blades,  
a first blade arm connected to said first blade,  
a second blade arm operably coupled to said first blade arm,  
and  
a flexure interconnecting said second blade to said second  
15 blade arm.

67. The self-aligning access platform of claim 66, further comprising first and second flexures forming a "V"-shaped blade mount interconnecting said second blade arm to said second blade.

20 68. The self-aligning access platform of claim 66, further comprising a tension member connected to said second blade at a second flexure and interconnected to said second blade arm.

69. A bladeless access platform comprising  
a tubular body having top and bottom edges, and

a pair of elongated handles extending upwardly from the top of said tubular body.

70. The bladeless access platform of claim 69 wherein said tubular body comprises sidewalls that are concave in shape.

5 71. A bladeless access platform comprising  
a hollow conically shaped body having a first tip portion releasably coupled to a second portion, and  
a plurality of threads formed on the exterior of said conically shaped body.

10 72. The bladeless access platform of claim 71, wherein said conically shaped body further comprises a third portion releasably coupled to said second portion.

15 73. The bladeless access platform of claim 72, further comprising splined connections that interconnect said second portion to said first tip portion and said third portion.

74. The bladeless access platform of claim 72, further comprising locking tabs positioned within locking grooves formed within said second and third portions.

20 75. The bladeless access platform of claim 72, further comprising finger or drive tool pockets formed in the interior of said first tip, second and third portions.

~~76.~~ An access platform comprising  
first and second blades, and

an offset spreader assembly including a handle pivotally mounted at one of its ends to said first blade and at a midpoint to said second blade to spread and raise the second blade relative to the first blade in one motion, and

5 a guide link pivotally connected to said first and second blades.

10 77. The access platform of claim 76 wherein said handle of said offset spreader is "U"-shaped and is pivotally connected to said first and second blades adjacent opposing ends of said first and second blades, and a second guide link pivotally connected to said first and second blades.

15 78. The access platform of claim 76, further comprising a first blade mount extending upwardly from said first blade and a second mount extending downwardly from said second blade, said first blade mount being pivotally mounted to said handle at a midpoint of said handle and said second blade mount being pivotally mounted to said handle at one of its end, and said guide link being pivotally mounted to said first and second blade mounts.

20 79. The access platform of claim 78, wherein said offset spreader assembly is releasably mounted to said first and second blades and further comprises

a dovetail assembly comprising first and second tails formed in said first and second blade mounts, and



first and second pins extending from said first and second blades to mate with said first and second tails.

80. The access platform of claim 79, further comprising an offset positioner assembly releasably coupled to said first and second blades.

81. The access platform of claim 80, wherein said offset positioner assembly further comprises

first and second position mounts formed on said first and second blades,

a positioning arm releasably coupled to said first and second position mounts, and

a sternal pad and arm rotatably coupled to said positioning arm.

82. The access platform of claim 81, further comprising a pawl pivotally coupled to said sternal pad arm and operably connected to a ratchet which is interconnected to said positioning arm.

83. The access platform of claim 82, wherein said positioning arm further comprises first and second splined shafts extending from said positioner arm adjacent first and second ends of said positioning arm, said splined shafts being received in and discreetly coupled to first and second splined holes formed in said first and second position mounts on first and second blades.

84. A method for dissecting an internal mammary artery comprising the steps of

positioning a superior blade, superior blade arm, sternal pad arm and sternal pad of an access platform on the patient's chest, the superior blade arm extends from the superior blade and is rotatably coupled to the sternal pad arm which extends from the sternal pad,

inserting the superior blade into an incision in the patient's chest wall,

sliding the superior blade under the superior ribs adjacent to the incision,

adjusting the sternal pad downwardly to the patient's chest by rotating the pad arm relative to the superior blade arm,

aligning an inferior blade and spreader member of the access platform on the patient's chest, the inferior blade being coupled to the spreader member,

inserting the inferior blade into the incision in the patient's chest,

coupling the superior blade, superior blade arm, sternal pad and sternal pad arm rotatably to the spreader member of the access platform at a pivot point above the superior blade,

spreading apart the inferior and superior blades and corresponding ribs,

transmitting a spreading force from the inferior blade to the superior blade through the pivot located above the superior blade at a position where the superior blade, superior blade arm, sternal pad and sternal pad arm are rotatably coupled to said spreader member,

rotating said superior blade upwardly around the pivot to offset the superior ribs, and  
dissecting the IMA.

85. The method of claim 84 further comprising the steps of connecting a vertical displacement member to the spreader member and the sternal pad arm, and

adjusting the vertical displacement member to further offset the superior ribs once said inferior and superior blades are separated.

86. The method of claim 84 further comprising the steps of sterilizing the access platform, and  
packaging the access platform in a sterile package.

87. The method of claim 84 further comprising the steps of inhibiting the upward rotation of the superior blade by applying a spring force to a counterlift tab attached to the superior blade arm.

88. A method of performing a heart bypass comprising the steps of

inserting first and second blades into an incision in a patient's chest,

5 inserting first and second blade arms extending from the first and second blades into first and second vertical displacement members which are interconnected to a spreader member of an access platform,

10 spreading apart the first and second blades and corresponding ribs,

positioning first and second support members which are interconnected to the first and second vertical displacement members and the first and second blades on the patient's chest,

15 adjusting the first vertical displacement member to raise the first blade upwardly,

adjusting the second vertical adjusting member to lower the second blade,

dissecting the proximal portion of the IMA,

adjusting the second vertical displacement member to raise

20 the second blade upwardly

adjusting the first vertical displacement member to lower the first blade,

dissecting the distal portion of the IMA,

leveling the blades,

[illegible]